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dum crystals with a border of fibrolite and enclosed in micaceous schist, one new locality for tourmaline, one new locality for aqua marine, and in conjunction with Mr. W. E. Hidden, I discovered forty-one different minerals in a few ounces of Brindletown gold sands, being by far the largest and rarest number ever obtained at one time by an examination of these celebrated sands:

Titanium.	Zircon.
Titanite.	Thorium.
Menaccanite vel Ilmenite.	Graphite.
Rutile.	Corundum (white).
Anatase vel Octahedrite.	“ (blue).
Octahedrite.	“ (red).
Ilmenite.	“ (gray).
Brookite.	“ (yellow).
Iron.	Feldspar.
Limonite.	Albite.
Mag. Iron.	Actinolite.
Granite.	Tourmaline.
Gneiss.	Schorl.
Itacolumbite.	Epidote.
Quartz.	Beryl.
Garnet.	Tremolite.
Schist.	Hornblende.
Monazite.	Soapstone.
Amethyst.	Kyanite.
Gold.	Cairngorm Stone.

This paper, in conclusion, is merely to place on record the results of my three years' field work amongst the minerals of North Carolina, until I can elaborate them (with engravings) in a substantial book form.—*John T. Humphreys, Greensboro, N.C.*

GEOLOGICAL NEWS.—Prof. Hitchcock is preparing a new geological map of the United States.—Prof. Hall has identified the Oneonta and Montrose sandstones, and finds them to form a fresh-water deposit below the Chemung.—Prof. Collett has found a remarkable deposit of extinct Unionidæ in Vandenburg county, Ia.—Prof. Leidy has determined a number of species of Vertebrata from bones found in a cave in Northampton county, Pa. All of the species are existing excepting two, a *Castoroides* and a Peccary. — Mojsisovics and Neumayr are publishing an extensive work, *Beiträge zur Palaeontologie von Oesterreich-Ungarn*. The two first monographs have appeared; they are Lugmayer on Rhætic *Brachiopoda*, and Bittner on Early Tertiary *Echinida* of the Southern Alps.

#### GEOGRAPHY AND TRAVELS.<sup>1</sup>

THE EXPLORATIONS OF CAPELLO AND IVENS IN WEST CENTRAL AFRICA.—In previous numbers of the *NATURALIST* some accounts have been given of the expedition fitted out early in 1877, by the Government of Portugal and the Lisbon Geographical Society for the exploration of western and southern Central Africa. The party was under the command of Major Serpa Pinto, and started

<sup>1</sup> Edited by ELLIS H. YARNALL, Philadelphia.

from Benguela on the west coast, proceeding by a southern route, touching the fifteenth parallel of south latitude, entering the mountainous region of Dombé, and passing to the east of Quilengues, finally reached Bihé in March, 1878. Here Major Serpa Pinto left his companions and started on his perilous journey along the upper waters of the Quando and Zambesi, and thence southward through the Transvaal and Natal to the east coast.<sup>1</sup>

Captain B. Capello and Lieutenant R. Ivens left Bihé in May, pursuing a north-easterly direction, crossing the Quanza, whose source is the Mussombo lake in S. lat.  $13^{\circ} 30'$ , E. long.  $17^{\circ}$ , and after long marches through an overflowed country, on June 24th arrived at the Luando, an important tributary of the Quanza. To the north of this stream are the tribes of the Songos and Quiocos, while the Ganguellas, a strong powerful race of men who carry on an active trade with Bihé, occupy the country to the south. At the distance of two hundred and fifty miles from Bihé the forest district of Quioco was reached, one of the most interesting of Central Africa in its hydrographical character. From here the expedition followed the Quango river, Capello taking the east, and Ivens the west side of the stream. Both found the country very difficult to penetrate owing to the overflowing of the river, and its many tributaries, the density of the vegetation and the broken irregular character of the surface. The explorers met finally at Cassange, and made several excursions east and north from that point. Proceeding from there to Malange, and turning north, they followed the eastern slope of the Tala-Mogongo range, crossing many streams flowing into the Hamba, an important affluent of the Quango to the forest country of Hungo. Marching on they discovered a great number of streams and countless small lakes. MM. Capello and Ivens believe that these should take the place of the large lake, Aquilonda, found on many maps at this point ( $7^{\circ}$  S.  $17^{\circ}$  E.), and which they state does not exist. After arriving at a small village called Malundo, about  $7^{\circ} 30'$  S. and  $16^{\circ} 30'$  E. they were obliged to retrace their steps owing to the exhaustion of their stores, illness, and the difficulties of the country.

To the east of the Quango here is the country of Jaca, one of the most important of the African interior, which extends as far as the Congo and was entirely unknown previously. The return was made to the Portuguese settlement of Duque de Braganza on the Lucalla, and through a fruitful, healthy country to the Quanza, the course of which river they followed down to the sea. They reached Portugal in January last, and this account is taken from papers read by them before the Lisbon Geographical Society, and the Geographical Section of the British Association. A beautiful detailed map in MS. of the country explored was exhibited at the

<sup>1</sup> NATURALIST, September, 1879, p. 593.

latter. The route is roughly shown in a "Provisorische Karte," published in *Petermann's Mittheilungen* for September, 1880.

The total length of the land journey thus accomplished was 4214 kilometers.

As to general configuration, the whole region of West Africa covered by the expedition south of the equator may be described as consisting of three well-marked areas: i. A central table-land where the richness of the soil and the regularity of the rain-fall cause a luxurious and varied vegetation; ii. A hilly region surrounding the table-land and forming a water-shed dividing the waters of the Quanza, Cunene, Cubango and other large rivers, and possessing a less luxuriant but abundant flora, and a variety of fruits and vegetables; iii. A zone of lowland near the coast barren and unhealthy from the many swamps.

Between Benguela and Bihé innumerable streams were crossed, almost all of them having their sources in the elevated central regions, and reaching the coast by successive rapid descents between the 9th and 17th parallels of latitude. Among the most remarkable is the Copororo (the left bank of which was followed by the expedition), the Cunene, and the Cubango (the course of which, by exception, is towards the south-east). All these rivers are extremely tortuous and full of rocks, and their currents being rapid, they seem in general to be little adapted for any kind of navigation.

Another peculiarity of the river systems is the tendency of the innumerable affluents on each side to flood their banks, thus rendering their survey extremely difficult. All take their rise on the northern or southern slopes of the great central ridge which traverses the interior in the latitude of Quioco, south of Bihé, and is prolonged south of Lake Bangweolo under the name of Muchinga, to the plateau of Lobisa. This is the most important elevation of Central Africa south of the equator, as it forms the dividing point between the basins of the Congo and the Zambesi, in conjunction with another elevated ridge called Mossambé, running north and south, and intersecting it in 12° S. lat., and 18° E. long., on which are the sources of innumerable affluents of the Zambesi and the Congo.

On account of this intersection taking place near it, the region of Quioco must be considered as of high interest to the scientific geographer, and well deserving of the epithet of "Mother of Waters" in south-west Central Africa. In the space of 1000 square miles around the residence of a chief named Mune Quibau the expedition discovered, at distances not more than twenty miles apart, the source of five or six of the most important rivers of the continent, viz: the Quango, the Kassai, the Luando, the Chicopa, the Lume, and the Jombo, besides about a hundred smaller streams, tributaries of the preceding.

The Quango at first flows between the two great mountain

ranges of Tala-Mogongo (on the west) and Moenga (on the east) forming many cataracts and rapids, and receiving many affluents, all of which were surveyed. The most important falls are six in number, the last being situated in  $8^{\circ}$  S. lat. Many of the affluents were previously unknown. In the 7th parallel of south latitude, the mountain range of Tala-Mogongo cuts obliquely another system of sierras, named in the north, Zombo, which extends to the Congo above the Yellala falls. The extensive region of small lakes before mentioned is situated on the slopes of this latter mountain range, and the expedition charted various rivers having their origin in the range as also all the numerous streams of the western slope in the Luamba region. With regard to the natives—all belonging to the great Bantu division of the Ethiopian race—the general observation may be made that the physical, mental and social development of the very varied tribes improves in the ratio of the altitude of the locality. The greater the altitude of his home the more perfect is the native, and the natives of the coast region are the most rachitic, the least intelligent and the most unfortunate of all. In the industrial arts it is also remarkable that the tribes farthest in the interior, and therefore most remote from European contact, are the most ingenious. The coast native does not manufacture a knife for his own use, the inhabitant of the plateau does; the latter even manufactures hoes, and sells them to the degraded coast negro. The difference is enormous between the Ganguella and the Maiaca, the one living at an altitude of 5500 feet, in a climate of  $64^{\circ}$  mean temperature, and the other at an altitude of 1600 feet, in a mean temperature of  $80^{\circ}$ .

The political system is very similar in all the tribes. Each has a chief who at times transmits his power to his successors in a collateral line, while at other times a chief is elected by the people. Polygamy is characteristic of the lowest tribes; fetishism and the most brutal superstition and slavery everywhere prevail.

The expedition collected material throughout their journey towards vocabularies of the many native languages. Being furnished with a very complete outfit of scientific instruments, they have been able to bring home an extensive series of observations in magnetism and meteorology as well as in all appertaining to their special work, the fixing of positions by astronomical and hypsometrical observations, and the geographical survey of the regions traversed.

COL. PREJEVALSKY.—Further accounts received from Col. Prejevalsky informs us, that in May last he was at Houi-dé on the Hoang-ho. He left Sining on March 20th, and explored the Yellow river for one hundred miles or more, but was unable to proceed further or ascertain the sources of this great river. At Gomi, where the river is 8000 feet above the sea-level, it is from 420 to 490 feet wide. Above this place their "progress was fre-

quently arrested by deep ravines, which seam the banks, and suddenly disclose their precipitous and dismal depths, the more unexpectedly as the plain over which one happens to be marching appears to be perfectly level. A river usually flows at the bottom of these enormous crevasses bordered with trees and shrubs. Footpaths lead into many of them, but the descent is most difficult, especially for mules and pack-camels."

On reaching the mouth of the Churmysh, and reconnoitering the country for a distance of nearly thirty miles, Prejevalsky "became convinced of the impossibility of crossing the enormous mountain-chain extending along the Yellow river. The summits of these mountains are lost in clouds, gloomy ravines are encountered at every verst, and there is not the slightest trace of vegetation, therefore no forage for our animals. Pursuing my investigations further, I saw clearly that our mules could never go round these mountains, the roads being only accessible for camels accustomed to the privations of the desert, and it is even doubtful if camels could accomplish the ascent of the Burkan-Buddha." He therefore turned back down the stream to Houi-dé, forty miles below Gomi, arriving there two months after his departure from Sining.

Five hundred specimens of birds and many fishes and plants have been collected. "Blue pheasants were particularly numerous. This fine bird, only a few specimens of which may be seen in the Museums of Paris, St. Petersburg, and London is met with frequently at an altitude of 9500 feet. Every day we killed several, and preserved twenty-six for our collections. Had it not been for difficulty of transport, we might have collected hundreds. The second rarity of this country is rhubarb, often found in large quantities. Old roots of it grow to a colossal size. One of those I took measured sixteen inches in length, twelve in breadth, and seven in thickness, and weighed twenty-six pounds."

#### MICROSCOPY.<sup>1</sup>

ADULTERATIONS OF DRUGS.—A report on this subject by C. Lewis Diehl, in the National Board of Health Bulletin, states that most of the information that can be gained on the subject is too vague or general in its character to be satisfactory. It is understood that the falsification of drugs is carried on extensively at the present time, and it is known that certain drugs are particularly subject to adulteration or falsification, but there is great difficulty in obtaining particulars that are definite or valuable. The literature of the subject, except a few papers of general scope, is mostly included in the standard text books of pharmacy, and in the Proceedings of the American Pharmaceutical Association, which have been published annually since 1852. The author discriminates carefully between deteriorations which may take place

<sup>1</sup>This department is edited by Dr. R. H. Ward, Troy, N. Y.